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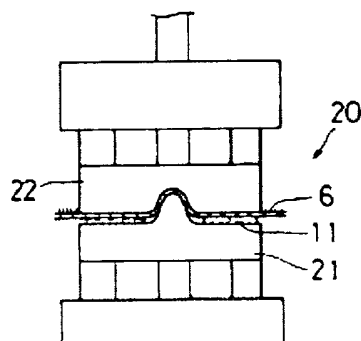
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**(54) [Title of the Invention] Method for Manufacturing a Carpet****(57) [Summary] (Revised)**

**[Object]** An object is to provide a method for manufacturing a carpet that has adequate sound insulation and vibration insulation properties and in which urethane foam is firmly bonded to a backing layer on the carpet main body.

**[Structure of the Invention]** A hot-melt film is laid over the top surface of a lower mold 21 of a urethane foam mold, urethane is injected and foamed, the urethane foam 11 thus formed is set at a necessary location on the lower mold 21 of a press mold 20 such that the urethane foam 11 is turned over to place the hot-melt film next to an upper mold 22, a carpet main body 6 heated thereon in a heater is set with a backing layer facing the side of the urethane foam 11, and the upper mold 22 is pressed onto the lower mold 21 to mold the carpet main body 6, whereby the hot-melt film on the surface of the urethane foam 11 is heated by the heat from the carpet main

body 6, the resin of the hot-melt film is melted, and the backing layer of the carpet main body 6 and the urethane foam 11 are mechanically bonded together.



#### [Claims]

**[Claim 1]** A method for manufacturing a carpet, characterized in that a hot-melt film is laid over a urethane foam mold in advance to foam and mold the urethane; the urethane foam thus molded is arranged such that the hot-melt film is set upward on the lower mold surface of the press; a carpet main body heated thereon is press molded integrally with the urethane foam while the backing layer is set downward, and the urethane foam is bonded to the back surface of the backing layer of the carpet main body.

#### [Detailed Description of the Invention]

##### [0001]

**[Technological Field of the Invention]** The present invention relates to a method for manufacturing a carpet lined with urethane foam placed on the floor of an automobile or the like.

##### [0002]

**[Prior Art]** A conventional method for manufacturing a carpet is described below.

**[0003]** Fig. 7 is a perspective view of a carpet 10 placed along the floor of an automobile. Floor carpets for automobiles lined on the back surface with urethane foam 11 or the like for sound insulation, vibration insulation, buffering, and the like, are widely used.

**[0004]** The conventional carpet 10 is foam-molded by coating the foam mold with wax, emulsified oil, or another such release agent when the urethane is foam-molded, and, as shown in

Fig. 8, the urethane foam 11 is set on the press mold 20, molded, and bonded to the preheated carpet main body 6 by pressing.

[0005]

**[Problems Which the Invention Is Intended to Solve]** However, the conventional method described above has drawbacks. For example, the release agent coated on the foam mold sticks to the surface of the urethane foam 11, the urethane foam 11 has difficulty adhering to the backing layer 8 of the carpet main body 6, sound insulation and vibration insulation in the carpet 10 are adversely affected, and product quality is also degraded.

[0006] The present invention is intended to solve the above-described problems of the prior art, and an object thereof is to provide a method for manufacturing a high-quality carpet with adequate sound insulation and vibration insulation properties, wherein urethane foam is firmly bonded to a backing layer on the carpet main body.

[0007]

**[Means Used to Solve the Above-Mentioned Problems]** In order to achieve this object, the method for manufacturing a carpet of the present invention is characterized in that a hot-melt film is laid over a urethane foam mold in advance to foam and mold the urethane; the urethane foam thus molded is arranged such that the hot-melt film is set upward on the lower mold surface of the press; a carpet main body heated thereon is press molded integrally with the urethane foam while the backing layer is set downward, and the urethane foam is bonded to the back surface of the backing layer of the carpet main body.

[0008]

**[Operation of the Invention]** This method makes it possible to obtain a high-quality carpet with adequate sound insulation and vibration insulation properties, wherein the resin of the hot-melt film is melted by the heat from the heated carpet main body, the backing layer surface of the carpet main body and the urethane foam surface are mechanically bonded together, and urethane foam is firmly bonded to the backing layer on the carpet main body.

[0009]

**[Practical Examples]** An embodiment of the present invention is described below with reference to diagrams. The parts identical to those shown in the conventional example are denoted by the same symbols.

[0010] Figs. 1 and 2 are process drawings of urethane foam relating to the present invention. In Fig. 1, a urethane foam mold 1 is made to foam by forming a lower mold 2 and an upper mold 3 in conformity with the shape of the urethane foam, laying a hot-melt film 4 over the top surface 2a of the lower mold 2 of the urethane foam mold 1, inserting urethane 5, and closing the upper mold 3. The hot-melt film 4 is a film consisting of either one or a mixture of urethane, olefin, polyamide, and/or vinyl acetate resin, and is predisposed to soften at 120°C to 150°C. When the urethane 5 is molded and solidified and the upper mold 3 is opened to remove the foam mold 1, the urethane foam 11 is obtained in a manner such that the surfaces of the urethane 5 (except for the upper surface) are enclosed by the hot-melt film 4, as shown in Fig. 3.

[0011] In Fig. 4, the carpet main body 6 is obtained by polymerizing Mass Back or another such backing layer 8 (itself obtained by packing the polyethylene or synthetic resin on the back surface of a carpet layer 7 with a filler), and heating the backing layer to 150°C-160°C with a heater 9.

[0012] Figs. 5 and 6 are process drawings of the carpet main body during molding. In Fig. 5, the press mold 20 is set such that the lower mold 21 and the upper mold 22 are formed in conformity with the shape of the product, and the above-described urethane foam 11 is turned over at a necessary location on the lower mold 21 to place the hot-melt film next to the upper mold 22, the carpet main body 6 heated in the heater 9 is set with the backing layer 8 facing the urethane foam 11 side, and the upper mold 22 is pressed onto the lower mold 21 to achieve the state shown in Fig. 6.

[0013] By this process, the hot-melt film 4 on the surface of the urethane foam 11 is heated by the heat from the carpet main body 6, the resin of the hot-melt film 4 is melted and forced into the irregularities between the back surface of the backing layer 8 of the carpet main body 6 and the front surface of the urethane foam 11, and the elements are mechanically bonded together by an anchoring effect. Therefore, it is possible to obtain a high-quality carpet 10 that has adequate

sound insulation and vibration insulation properties and in which the backing layer 8 of the carpet main body 6 and the urethane 5 are firmly bonded together.

[0014] According to the present embodiment as described above, the hot-melt film 4 is laid over the top surface 2a of the lower mold 2 of the urethane foam mold 1; the urethane 5 is injected and foam-molded; the urethane foam 11 thus formed is set such that the above-described urethane foam 11 is turned over at the necessary location on the lower mold 21 of the press mold 20 to place the hot-melt film 4 next to the upper mold 22; the carpet main body 6 heated in the heater 9 is set with the backing layer 8 facing the side of the urethane foam 11; and the upper mold 22 is pressed onto the lower mold 21 to mold the carpet main body 6, whereby the hot-melt film 4 on the front surface of the urethane foam 11 is heated by the heat from the carpet main body 6, the resin of the hot-melt film 4 is melted, and the backing layer 8 of the carpet main body 6 and the urethane foam 11 are mechanically bonded together. It is therefore possible to obtain a high-quality carpet 10 that has adequate sound insulation and vibration insulation properties and in which the backing layer 8 of the carpet main body 6 and the urethane foam 11 are firmly bonded together.

#### [0015]

**[Merits of the Invention]** As described above, the present invention makes it possible to obtain a high-quality carpet that has adequate sound insulation and vibration insulation properties and in which a hot-melt film is laid over a urethane foam mold in advance, the urethane is foam-molded, the urethane foam thus molded is arranged such that the hot-melt film is set upward on the lower mold surface of the press, a carpet main body heated thereon is press molded integrally with the urethane foam while the backing layer is set downward, and the urethane foam is bonded to the back surface of the backing layer of the carpet main body, whereby the resin of the hot-melt film is melted by the heat of the heated carpet main body when the carpet is molded, and the urethane foam is firmly bonded to the backing layer of the carpet main body.

#### **[Brief Description of the Drawings]**

**[Figure 1]** A process drawing of the urethane foam in the embodiment of the present invention.

**[Figure 2]** A process drawing of the urethane foam in the embodiment of the present invention.

[Figure 3] A cross-sectional view of the urethane foam in the embodiment of the present invention.

[Figure 4] A process drawing of the carpet main body in the embodiment of the present invention during heating.

[Figure 5] A process drawing of the carpet main body in the embodiment of the present invention during molding.

[Figure 6] A process drawing of the carpet main body in the embodiment of the present invention during molding.

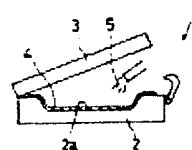
[Figure 7] A perspective view of a carpet on the floor of an automobile.

[Figure 8] A process drawing of a conventional carpet main body during molding.

[Key]

- 1: urethane foam mold
- 2: lower mold
- 4: hot-melt film
- 5: urethane
- 6: carpet main body
- 7: carpet layer
- 8: backing layer
- 10: carpet
- 11: urethane foam
- 20: press mold
- 21: lower mold
- 22: upper mold

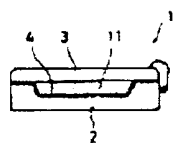
[Fig. 1]



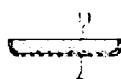
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|-----------------------|-------------------|
| 1: urethane foam mold | 8: backing layer  |
| 2: lower mold         | 10: carpet        |
| 4: hot-melt film      | 11: urethane foam |

5: urethane	20: press mold
6: carpet main body	21: lower mold
7: carpet layer	22: upper mold

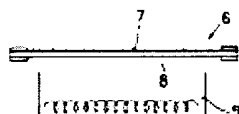
[Fig. 2]



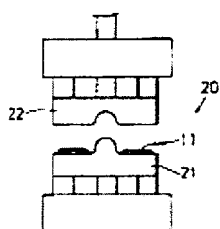
[Fig. 3]



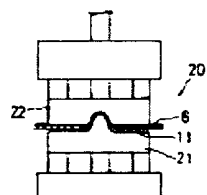
[Fig. 4]



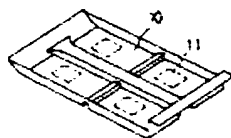
[Fig. 5]



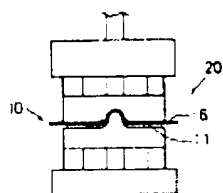
[Fig. 6]



[Fig. 7]



[Fig. 8]



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